

## Claims

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3 1. Piezoelectric element with a multilayer structure of piezoelectric plies (4)  
4 having electrodes (6, 7; 21, 22) arranged between them, and having  
5 - a lateral contacting of the electrodes (6, 7; 21, 22) in alternate directions  
6 via external electrodes (9, 10), wherein  
7 - the individual piezoelectric plies (4) are composed of a continuous film (2;  
8 20) that can be folded during manufacture, that are entirely or partially  
9 provided with the electrically conductive electrodes (6, 7; 21, 22).

10

11 2. Piezoelectric element according to Claim 1, characterized in that  
12 - the film (2; 20) for producing the electrodes (6, 7; 21, 22) is entirely or  
13 partially metallized, that  
14 - the piezoelectric plies (2; 20) are formed by folding at notches (5, 5.1, 5.2)  
15 created at specified intervals transverse to the direction of folding, wherein  
16 the internal electrodes (6, 7; 21, 22) are formed by the metallized layers  
17 lying inside the notches (5, 5.1, 5.2) after the folding, and the metallized  
18 layers are interrupted on the outside of the notches (5, 5.1, 5.2), and that  
19 - the internal electrodes (6, 7, 21, 22) are contacted with the external  
20 electrodes (9, 10) on the insides of the notches (5, 5.1, 5.2) projecting  
21 outward after the folding.

22

23 3. Piezoelectric element according to Claim 2, characterized in that  
24 - only every other surface between the notches (5, 5.1, 5.2) is metallized in  
25 each case, at least on one side of the film (20).

26

27 4. Piezoelectric element according to Claim 2 or 3, characterized in that  
28 - the external electrodes (9, 10) are composed of an electrically conductive  
29 screen or net.

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31 5. Piezoelement according to Claim 2 or 3, characterized in that

1 - the external electrodes are composed of wave electrodes (9, 10).

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3 6. Piezoelectric element according to one of the preceding claims,  
4 characterized in that

5 - the multilayer structure of piezoelectric plies (4) is provided with an  
6 electrically insulating ceramic plate (11, 12) on each end of the folded  
7 plies.

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9 7. Piezoelectric element according to one of the preceding claims,  
10 characterized in that

11 - the piezoelectric element (1) is a component of a piezoelectric actuator  
12 that can be used to actuate a mechanical component such as a valve or  
13 the like.

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15 8. Method for producing a piezoelectric element (1) according to one of the  
16 Claims 2 through 7, characterized in that

17 - the piezoelectric film (2; 20) is cut to the width of the piezoelectric element  
18 (1) and provided with notches (5, 5.1, 5.2) at specified intervals, always in  
19 alternate directions, that

20 - the piezoelectric film (2; 20) is metallized entirely or partially on both sides,  
21 that

22 - the piezoelectric film (2; 20) is folded at the notches (5, 5.1, 5.2), always  
23 around the inside of the notch (5, 5.1, 5.2), and that

24 - the external electrodes (9, 10) are applied by means of soldering to the  
25 internal electrode (6, 7; 21, 22) in the bending region, in the inside of the  
26 notch (5) projecting outward after the folding.

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28 8. Method according to Claim 7, characterized in that

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1 - an electrically insulating head and foot plate (11, 12) composed of  
2 piezoelectric ceramic are installed on the external piezoelectric plies (4)  
3 before sintering.

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*Head #2*